

# *Content Protection System For Secure Video Recording*

## ***MG-R(SVR) For MemoryStick PRO, Hi-MD***

**MG-R(SVR) = MagicGate Type-R for Secure Video Recording**

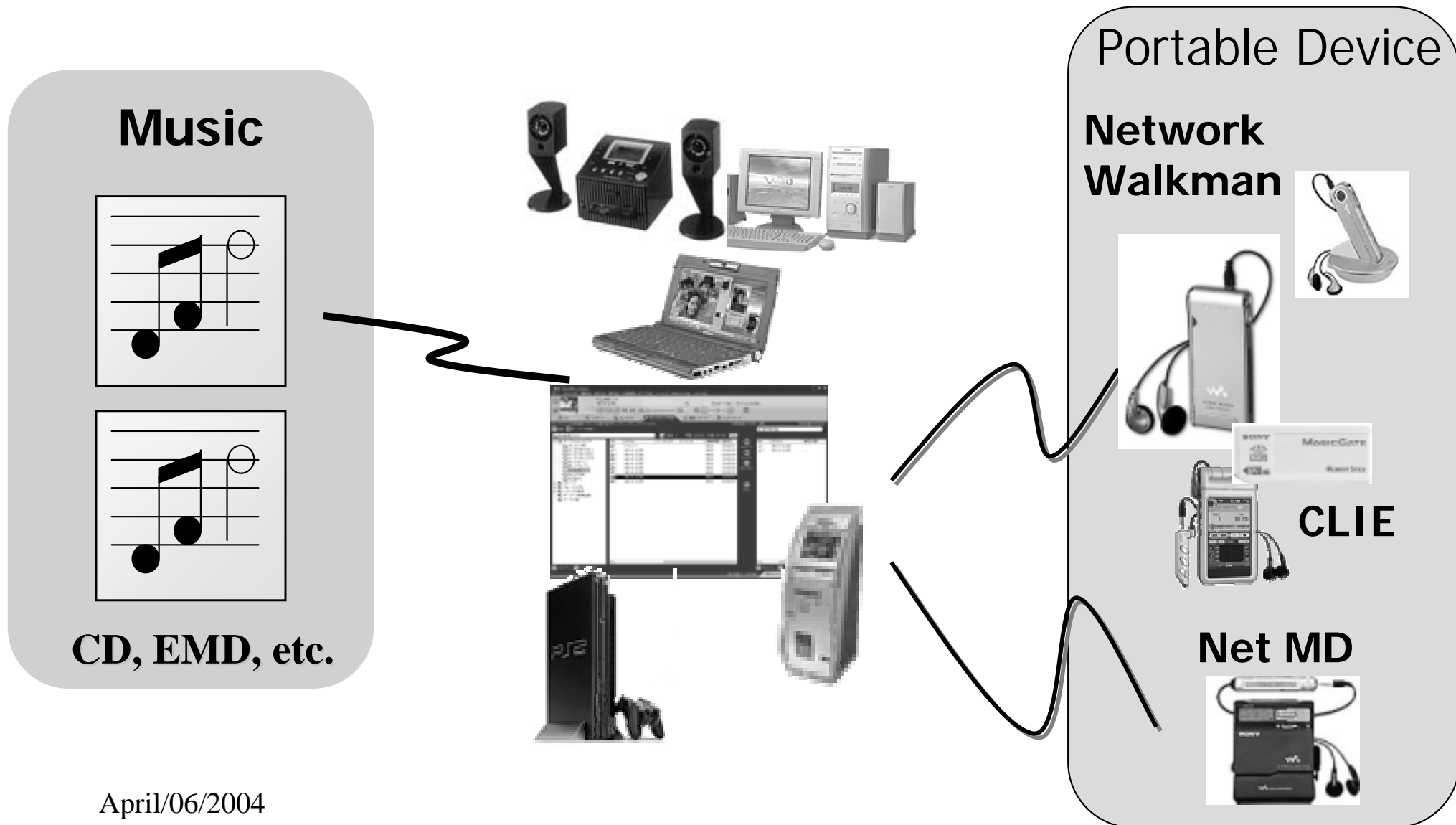
*April 6, 2004*

*Yasuko Miura  
MG-R Planning Manager  
MemoryStick Business Center  
Sony Corporation, Japan*

# Today's Agenda

- |  |                               |
|--|-------------------------------|
| 1) Overview of MS-PRO and<br>Hi-MD Media & Products  | 15 minutes<br>Yasuko Miura    |
| 2) Overview of Technical Explanation<br>of MG-R(SVR) | 20 minutes<br>Toshiya Kaihoko |
| 3) Contractual Obligations                           | 15 minutes<br>Yasuko Miura    |
| 4) Summary   | 10 minutes<br>Yasuko Miura    |
| 5) Additional Questions and Discussion               |                               |

# Background: MagicGate for Secure Music



# MG-R(SVR) Target World

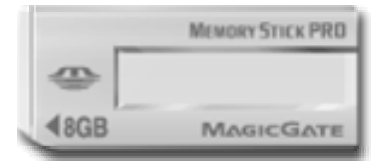
**Digital  
broadcasting  
content**

U.S.  
Japan

Other  
copy protected  
video content



**MS PRO**



**Hi-MD**



# MG-R(SVR) Compliant Media: 2 Types



**Memory Stick PRO**



**Hi-MD**

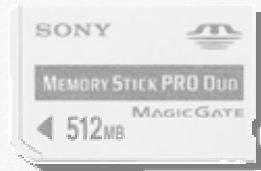
# Memory Stick PRO

Memory Stick PRO is an advanced flash memory medium, and comes in two sizes: a standard size and a smaller size called Memory Stick PRO Duo.



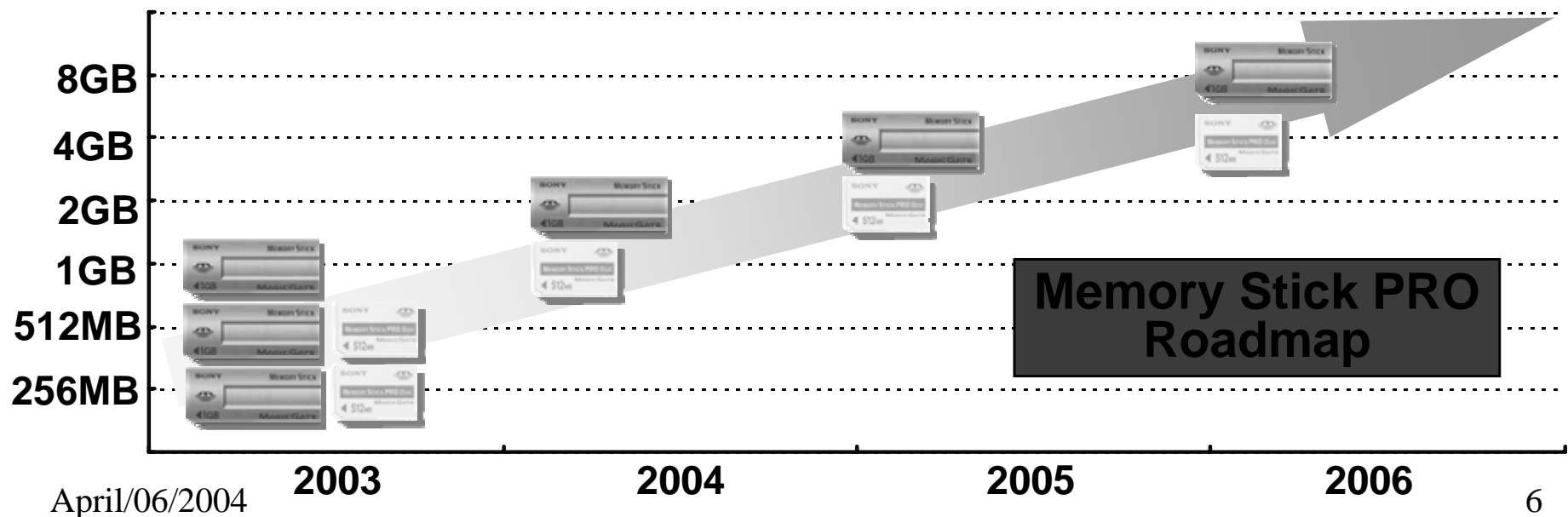
## Memory Stick PRO

- up to 2 GBytes at present
- 8 GBytes in near future



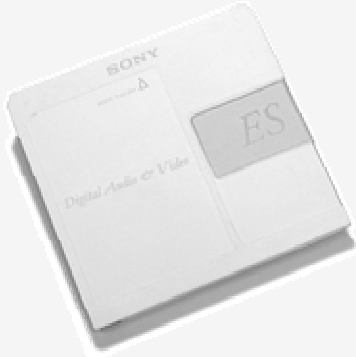
## Memory Stick PRO DUO

- smaller sized Memory Stick PRO
- for cellular phones and small devices



# Hi-MD Disc Media

Hi-MD is based on current MD technology.



## Hi-MD 300 MB

- 300 MBytes
- current MiniDisc media after formatted by Hi-MD devices



## Hi-MD 1G

- 1 GByte
- newly developed hi-density media

# MG-R(SVR) Video Products

(Illustrations are conceptual design images)



- Consumers can record and carry their favorite DTV content on recordable media and catch up on their favorite DTV shows in a train, cafe, etc.
- Consumers can enjoy their DTV programs anytime & anywhere with a portable device.



# Support by Content Owners

Sony has been informed by Fox, Warner Bros. and Sony Pictures Entertainment that those motion picture studios have reviewed the MG-R(SVR) technology and approved the technology as meeting sufficient levels of security and protection against unauthorized redistribution.

As the license agreements were finalized late February, we understand that as of the filing of Sony's certification, those studios reserved final approval pending review of the license agreements.

# Sony's Four Certifications



## Memory Stick PRO

- 1) Hardware implementation (04-58)
- 2) Software implementation: proprietary (04-56)



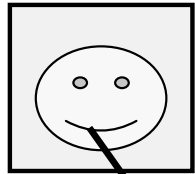
## Hi-MD

- 3) Hardware implementation (04-55)
- 4) Software implementation: proprietary (04-57)

We will explain MS PRO H/W implementation first.  
Then, we will explain the differences between H/W and S/W  
and the differences between MS PRO and Hi-MD.

# MG-R(SVR) for MS PRO (Hardware Implementation)

## DTV Content



**MG-R(SVR) Compliant Device (TV, VCR. etc)**

Digital Tuner

**Device Node Key (DNK)**

Robustness Rules  
&  
Compliance Rules

<Secure Video Module>

(6) Ensures secure digital output (DTCP, HDCP) of Marked and Unscreened Content

(5) Enables revocation

(4) Secure Authenticated Channel (SAC) between Secure Video Module and MS PRO media

(3) Authentication prevents alteration

**MS PRO**

Content

CCI, EPN, etc.

Encrypted Content



**Integrity Check Value (ICV) in hidden area**

**Media Unique ID**

**Media Key Set**

(1) AES 128 bit for content protection

(2) Prevents bit-by-bit copy & retransmission over Internet

April/06/2004

# Basic Concept of MG-R(SVR) Content Protection System for MS PRO(H/W)

- Content encryption using AES (128 bits)
- Prevents bit-by-bit copy
- Prevents retransmission over Internet
- Prevents alteration of content and CCI using Integrity Check Value (ICV)
- ICV is used for authentication to prevent playing unauthorized copy
- Authenticate between secure video module and media using secure authenticated channel (SAC)
- Provides revocation function
- Compliance and Robustness Rules (required by Hardware Adopter Agreement)

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**MS PRO**

Content

CCI, EPN, etc.

Encrypted Content



**Integrity Check Value (ICV) in hidden area**

**Media Unique ID**

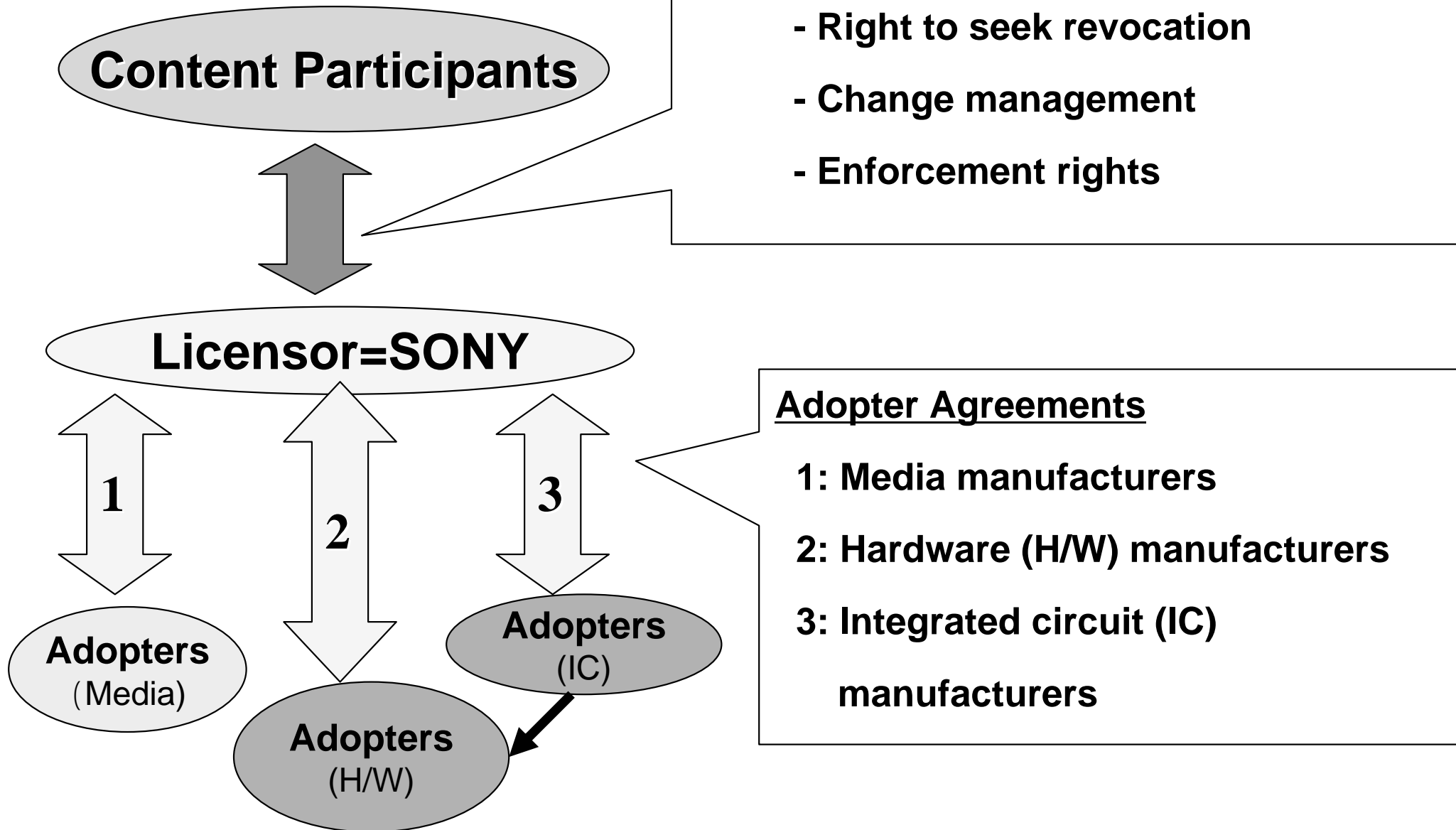
**Media Key Set**

(1) AES 128 bit for content protection

(2) Prevents bit-by-bit copy & retransmission over Internet

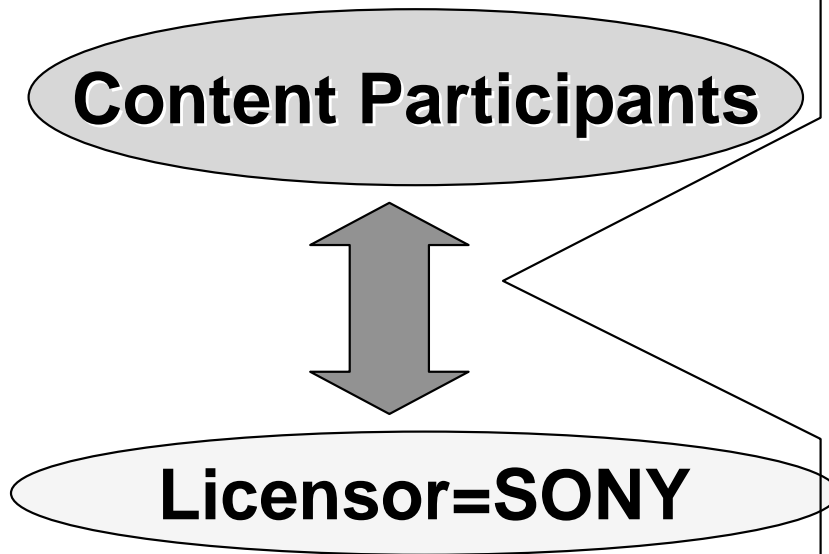
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# License Scheme





# License Scheme



## **Content Participant Agreement (CPA)**

### (a) Right to seek revocation

- limited by Revocation Criteria
- disputes resolved by arbitration

### (b) Change management

- right to object to material and adverse changes to the specifications, Adopter Agreements, Compliance and Robustness Rules

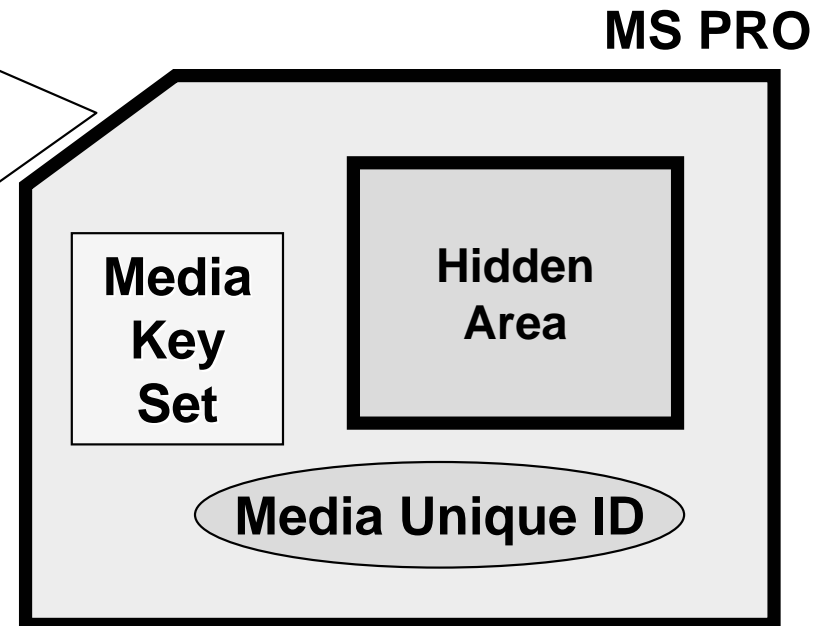
### (c) Enforcement rights

- third party beneficiary right to seek equitable relief to enforce compliance by Adopters
- right to seek equitable relief to enforce compliance by Sony (when Sony is implementer)

# License Scheme (media manufacturers)

## 1) Media Adopter Agreement

- right to implement MG-R(SVR) in Memory Stick PRO media
- requirement that media must have Hidden Area and Media Unique ID
- requirement to incorporate most up-to-date revocation information (EKB, carried in Media Key Set)



# License Scheme (H/W implementation)

DTV Content



**MG-R(SVR) Compliant  
Device (TV, VCR. etc)**

Digital  
Tuner

- Specification
- Robustness Rules
- Compliance Rules

**Secure IC  
(MG-IP)**

(Cryptographic  
Engine)

**2) Hardware Adopter Agreement  
(hardware manufacturers)**

-Hardware Adopter may purchase the Secure Integrated Circuit (Secure IC) from any entity that has executed an IC Adopter Agreement or may itself manufacture the Secure IC under IC Adopter Agreement

**3) IC Adopter Agreement  
(IC manufacturers )**

# License Scheme (H/W implementation)

**DTV Content**



**MG-R(SVR) Compliant  
Device (TV, VCR. etc)**

Digital  
Tuner

**Device Node Key (DNK)**

- Specification
- Robustness Rules
- Compliance Rules

**Secure IC  
(MG-IP)**

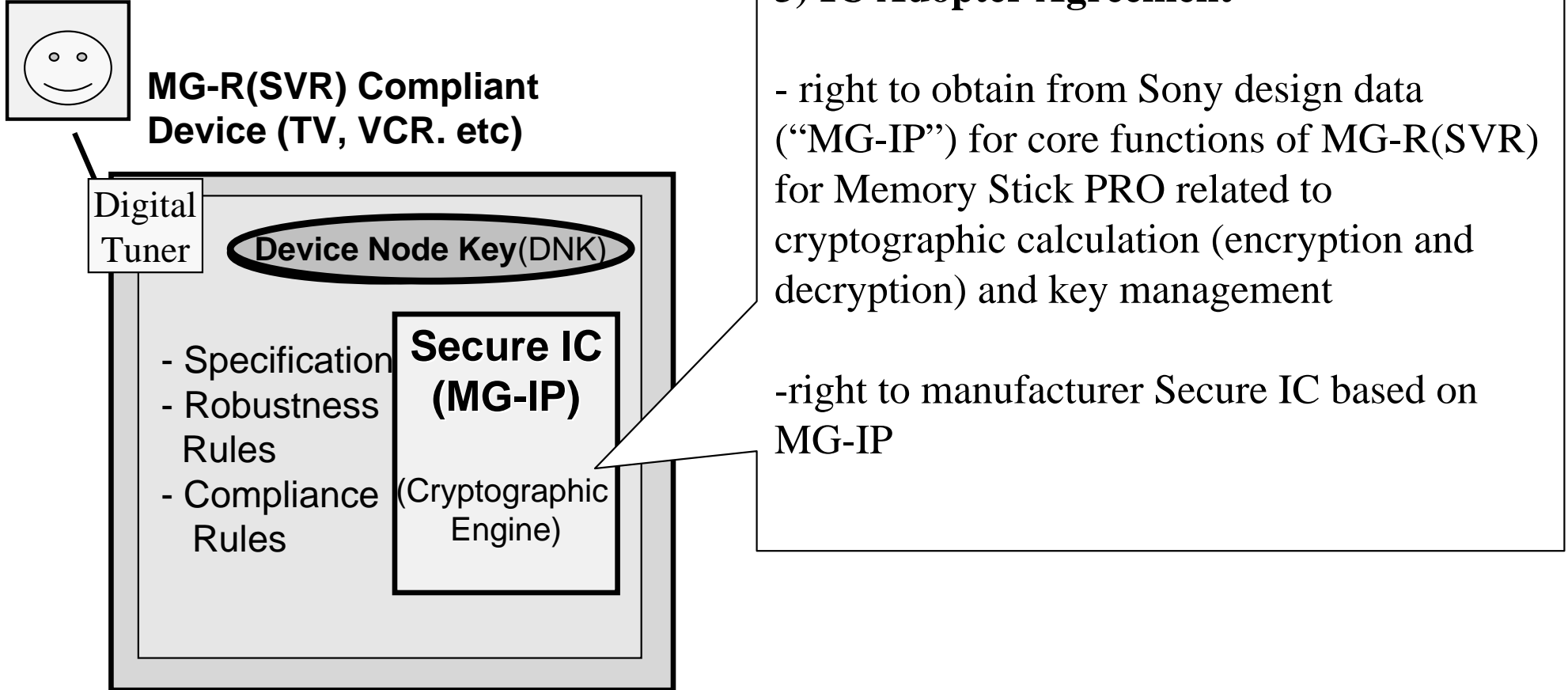
(Cryptographic  
Engine)

## 2) Hardware Adopter Agreement

- right to implement MG-R(SVR) for Memory Stick PRO in compliant devices (e.g., TV, VCR, portable recorder/player)
- requirement to incorporate a Secure IC (made under an IC Adopter Agreement) and a Device Key Set, which includes the Device Node Key (purchased from Sony)
- requirement to comply with the Compliance Rules and Robustness Rules

# License Scheme (H/W implementation)

## DTV Content



# Software (S/W) Implementation

- Software application will remain proprietary and will be made only by Sony
- Software may be provided to software vendors, manufacturers and/or end users as a compliant software implementation (“Software”)

## DTV Content



### MG-R(SVR) Compliant S/W

Digital  
Tuner

<Secure Video Module>

**Device Node Key (DNK)**

Cryptographic  
Engine (in S/W)

Fulfills specification, Compliance Rules and Robustness Rules (as required under Content Participant Agreement).

- DNK is pre-installed in Software
- All copies of any particular version of the Software may use the same DNK; revocation criteria in CPA applicable to S/W implementations contemplate the use of common DNKs
- Software can be upgraded

# Revocation Procedures

- Revocation criteria:
  1. a DNK has been cloned such that the same DNK is found in more than one device or product (hardware only)
  2. a DNK has been lost, stolen, intercepted or otherwise misdirected or made public or disclosed in violation of a Hardware Adopter Agreement
  3. Sony will also revoke a DNK by order from a court or other competent government authority
- Content Participant may request revocation
- Affected Licensees notified
- Revocation disputes resolved through arbitration
- Revocation information is incorporated in new products (and in new media, in case of Memory Stick PRO)

## Differences Between Hardware and Software Implementation

- Software will remain proprietary and will be made only by Sony
- Software may be provided to software vendors, manufacturers and/or end users as a compliant software implementation
- Compliance with specification, Compliance Rules and Robustness Rules is required under Content Participant Agreement
- Device Node Key (DNK) for revocation is pre-installed in Software. All copies of any particular version of the Software may use the same DNK. Revocation criteria in CPA applicable to S/W implementations contemplate the use of common DNKs
- Software can be upgraded



# Differences Between Hi-MD and Memory Stick PRO

## Obligation to Write Media Unique ID Onto Hi-MD 300 MB Media

- Ordinary MiniDiscs can be formatted (i.e., converted) to Hi-MD 300 MB format
- Because MiniDisc media do not come with Media Unique ID pre-written at factory, Hi-MD Hardware Adopter Agreement includes an obligation for Hi-MD devices to write a Media Unique ID onto MiniDisc media when formatting them into the Hi-MD 300 MB format
- Hi-MD 1 GB media (like Memory Stick PRO media) come from factory with Media Unique ID already installed

## Two-Part License Structure of Hi-MD Hardware Adopter Agreement

### 1. Basic CP Agreement

- includes obligations on Hi-MD generally (audio, video, etc.)
- requires compliance with Robustness Rules

### 2. Video Addendum

- includes obligations specific to recording and playing secure video content on Hi-MD
- requires compliance with Compliance Rules

# Conclusion



(Illustrations are conceptual design images)

MG-R(SVR) achieves the delicate balance of affording consumers a new and user-friendly way to enjoy DTV content, anytime, anywhere,

while helping to ensure the availability of high-value DTV content by protecting against unauthorized redistribution of DTV programming.